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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,930	12/19/2001	Ian Charles Madsen	POF 3.9-050 CONT	5652

7590 08/14/2003  
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EXAMINER
YUN, JURIE

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/024,930		MADSEN ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Jurie Yun		2882	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12-18, 20 and 23 is/are rejected.
- 7) ☒ Claim(s) 19, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

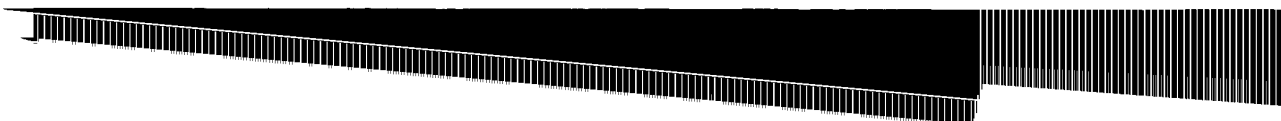
- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: _____                                    |



## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smallbone (USPN 5,627,874) in view of Hall (USPN 6,072,853).

3. With respect to claim 12, Smallbone discloses an apparatus for analyzing a stream of particulate material containing substances, including means for extracting a sample flow (column 5, lines 17-19) from the stream of particulate material, means for smoothing and flattening a surface of said sample flow to prepare the sample flow for X-ray measurements (column 5, lines 60-67), a measurement station including an X-ray generator and position sensitive detector for detecting X-ray patterns from the prepared sample flow (column 6, lines 1-14), processor means for analyzing the X-ray patterns to determine a composition for substances in the sample from each pattern and for providing a series of sequential composition determinations, thereby representing the composition of substances in the stream of particulate material (column 6, lines 33-34).

Smallbone does not disclose a measurement station including an X-ray generator and position sensitive detector for detecting X-ray **diffraction** patterns from the prepared sample flow, and processor means for analyzing the X-ray **diffraction** patterns to determine a composition for **crystalline** substances in the sample from each

**diffraction** pattern and for providing a series of sequential composition determinations, thereby representing the composition of **crystalline** substances in the stream of particulate material. Smallbone is concerned with fluorescence.

Hall discloses a measurement station including an X-ray generator (11) and position sensitive detector (19) for detecting X-ray **diffraction** patterns from the prepared sample flow, and processor means (21) for analyzing the X-ray **diffraction** patterns to determine a composition for **crystalline** substances in the sample from each **diffraction** pattern and for providing a series of sequential composition determinations, thereby representing the composition of **crystalline** substances in the stream of particulate material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Smallbone measurement station to include an X-ray generator and position sensitive detector for detecting X-ray **diffraction** patterns from the prepared sample flow, and processor means for analyzing the X-ray **diffraction** patterns to determine a composition for **crystalline** substances in the sample from each **diffraction** pattern and for providing a series of sequential composition determinations, thereby representing the composition of **crystalline** substances in the stream of particulate material, as taught by Hall, to enable composition analysis of crystalline substances.

4. With respect to claims 13 and 14, Smallbone does not disclose the position sensitive detector of the measurement station is a curved position sensitive detector for simultaneously detecting diffracted X-rays over an angular range, or that it is an area

detector. However, Smallbone discloses various types of detectors could be employed depending on the intent of the analysis (column 4, line 62 - column 5, line 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Smallbone apparatus to employ a curved position sensitive detector or an area detector to detect diffracted X-rays over an angular range, if it is desired to perform composition analysis of crystalline substances.

5. With respect to claim 15, Smallbone discloses the means for smoothing and flattening a surface of the sample flow includes a carrier for receiving the extracted sample flow, the carrier being drivable for continuous movement, whereby said means for smoothing and flattening the surface of the sample operates on the carrier as the carrier moves and prior to the carrier conveying the sample flow through the measurement station (column 5, lines 60-67).

6. With respect to claim 16, Smallbone discloses the carrier includes an endless groove (column 5, line 35) and said means for smoothing and flattening the surface of the sample packs the sample into the groove (column 5, lines 60-67).

7. With respect to claim 17, Smallbone does not disclose the means for smoothing and flattening the surface of the sample is a driven roller positioned over the endless groove. Smallbone discloses the means for smoothing and flattening the surface of the sample is a sample compactor positioned over the endless groove (column 5, line 62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Smallbone apparatus to employ a driven roller instead of a

sample compactor since these are functionally equivalent means to smooth and flatten the surface of the sample.

8. With respect to claim 18, Smallbone discloses means for removing excess sample from the carrier prior to said means for smoothing and flattening the surface of the sample packing the sample into the endless groove (column 5, lines 60-67).

9. With respect to claim 20, Smallbone discloses the carrier is formed for the sample to be removed therefrom, or the apparatus includes means for removing the sample therefrom, prior to where the carrier receives the extracted sample flow and after the sample passes the measurement station (column 6, lines 47-65).

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smallbone (USPN 5,627,874).

11. With respect to claim 23, Smallbone discloses an apparatus for presenting a sample from a stream of particulate material (column 5, lines 17-19) for X-ray measurements including, a carrier for receiving a continuous feed of the particulate material, the carrier being drivable for continuous movement (column 5, lines 31-53), and means for preparing the sample on the carrier and for smoothing and flattening the surface of said sample (column 5, lines 60-67), wherein the carrier is such that said sample is removed, or the apparatus includes means for removing said sample therefrom, as the carrier moves, the removal of the sample occurring prior to where the carrier receives the feed of sample and after the sample passes a measurement station (column 6, lines 47-65).

Smallbone discloses all of the claimed elements except that the apparatus is for X-ray diffraction measurements. Smallbone is concerned with X-ray fluorescence measurements. However, this would be a design choice, and it would have been obvious to one of ordinary skill in the art to modify the Smallbone apparatus to determine X-ray diffraction measurements to enable composition analysis of crystalline substances.

***Allowable Subject Matter***

12. Claims 19, 21, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In an apparatus as claimed in claim 12, prior art fails to disclose means for removing excess sample includes a scraper and vacuum apparatus. In an apparatus as claimed in claim 12, prior art fails to disclose the carrier is a horizontal wheel mounted for rotation about a vertical axis, and the endless groove is an annular groove in an upper surface of the wheel.

13. Claims 1-11 are allowed.

14. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose a method for analyzing a stream of particulate material containing crystalline substances including directing an X-ray beam onto the smoothed and flattened surface of the sample flow as it passes through a measurement station and detecting diffracted X-rays over an angular range to provide a diffraction pattern, as claimed in claim 1. Prior art also fails to disclose a method for continuously presenting a sample from a stream of particulate material containing crystalline substances for

obtaining X-ray diffraction analyses of the particulate material, including continuously moving the carrier to move the sample through a station for performing X-ray diffraction measurements on the flat and smooth sample surface, and continuously removing the sample from the carrier prior to feeding further sample flow onto the carrier, as claimed in claim 11.

### **Conclusion**

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Smallbone (USPN 5,272,745) discloses an apparatus for analyzing continuously flowing dry powder samples by means of X-ray spectroscopy.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 703 308-3535. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 703 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308-7722 for regular communications and 703 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0956.

Jurie Yun  
August 8, 2003



Craig E. Church  
Primary Examiner